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**United States Patent
Yamada****5,328,175
July 12, 1994**

Gold club head

Abstract

A golf club head made of a metallic material includes a projection which is rearwardly projected away from a face portion of a main body while forming a cavity having the substantially same interior configuration as the exterior configuration of the projection. A face member molded of a synthetic resin and having a fully closed air chamber formed therein is securely fitted into the cavity using an adhesive. A ball hitting surface of the face member is flush with the surface of the face portion. A thickness of the face member between the ball hitting surface and the air chamber is larger than a thickness of the same on the back portion side about three times.

Inventors: **Yamada; Magoichi** (Tokyo, JP)
Assignee: **Daiwa Golf Co., Ltd.** (Tokyo, JP)
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Current U.S. Class:**473/346 ; 473/345****Current International Class:****A63B 53/04 (20060101)****Field of Search:****273/167R,77A,193R,194R,162R,77R****References Cited [Referenced By]****U.S. Patent Documents**

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CLAIMS

[Utility model registration claim]

[Claim 1] The golf club head characterized by having formed the crevice which has the inside which carried out opening to the face section and met in the head body at the configuration of the above-mentioned back section, and fitting in the face object made of resin which prepared the air chamber of the letter of sealing surrounded by the above-mentioned lobe in this crevice while making the back section of the head body of a golf club head project back and preparing the lobe in the back section concerned.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed explanation of a design]

[0001]

[Industrial Application]

This design is related with the golf club head which combined with improvement in flight distance and aimed at improvement of endurance to the impact at the time of a hit ball.

[0002]

[Description of the Prior Art]

As for the head of iron crab, it is common that the hosel section, the SOL section, the face section, etc. are fabricated in one with metals, such as soft iron and stainless steel.

[0003]

However, although this kind of golf club head has the configuration and weight which were doubled with each yarn count, if it is lacking in elasticity since it is a metal lump and there is no elasticity in the face section most important for especially the hit of a ball, the soft feeling of a hit ball like wood crab will not be obtained small [that restitution coefficient].

[0004]

Then, the golf club head which attached the face plate made of resin in the face section of a head body in order to obtain a soft feeling of a hit ball conventionally is JP,35-31514,Y.

It is indicated by the official report.

[0005]

This golf club head ***s the face plate 9 made of resin which formed the cavity 7, and attaches it in a rear-face side face [attachment and detachment] by 11 in the crevice 5 established in the face section 3 of the head body 1 as shown in drawing 4.

[0006]

It ** and a hit ball side is pressing hard by having formed the cavity 7 in the face plate 9 according to this golf club head, and since a gap 13 is made between base 5a of a face plate 9 and a crevice 5 when ** also formed the cavity 7, the repulsive force by the elastic deformation of a face plate 9 can be expected.

[0007]

[Problem(s) to be Solved by the Device]

However, while repulsive force was acquired by the face plate 9 by having prepared Mr. ** the cavity 7, since a hit ball side was pressing hard, the fall of a face plate 9 on the strength was caused, and not achieving the function in which ** also softens the stress which the air in a gap 13 requires for a hit ball side as a kind of air cushion since the above-mentioned gap 13 is not sealing structure also had conjointly a possibility that a face plate 9 might be damaged by use over a long period of time.

[0008]

Moreover, although it is not the design about iron crab, as shown in drawing 5, centering on the hit ball side of the face plate 15 made of resin which fabricated the rear-face side to the concave, the chip 17 which consists of tungsten carbide or a titanium carbide is implanted in JP,49-50083U, and the wood club head with which the crevice 23 which prepared this in the face section 21 of the head body 19 was equipped is indicated.

[0009]

Although repulsive force was acquired by the face plate 15 by having fabricated the rear-face side of a face plate 15 to the concave even if it *(e) and was in the above-mentioned golf club head, there was a possibility that a face plate 15 might be damaged with the impact at the time of a hit ball, like the golf club head shown in drawing 4.

[0010]

It aims at offering the golf club head which this design was thought out in view of this actual condition, combined with improvement in flight distance, and aimed at improvement of endurance to the impact at the time of a hit ball.

[0011]

[Means for Solving the Problem]

In order to attain this purpose, while this design makes the back section of the head body of a golf club head project back and preparing a lobe in the back section concerned, the crevice which has the inside which carried out opening to the face section and met in the head body at the configuration of the above-mentioned back section is formed, and the face object made of resin which prepared the air chamber of the letter of sealing surrounded by the above-mentioned lobe in this crevice is fitted in.

[0012]

[Function]

Although a face object deforms by the impact when a hit ball is carried out with the golf club equipped with the golf club head concerning this design Big repulsion energy starts a golf ball according to the repulsive force and the elastic-deformation force of the hit ball side of a face object over compression of the air in an air chamber. ** the golf club head of this design Since an air chamber is the structure where the perimeter was surrounded by the lobe of the back section of a head body, the compression energy of the air by the impact will get across to a golf ball as repulsion energy efficiently.

[0013]

Moreover, an air-cushion operation according to the stress by the impact at the time of a hit ball to the air in an air chamber will absorb and distribute, and breakage of a face object will be prevented.

[0014]

[Example]

Hereafter, the example of this design is explained to a detail based on a drawing.

Drawing 1 shows the front view of the golf club head concerning one example of this design. 25 are the head body formed with the metal containing a fiber reinforced metal among drawing, and as for this head body 25, the back section 33 grade is fabricated by one as usual like the hosel section 27, the SOL section 29, the face section 31, and drawing 2. And as shown in drawing 2 and drawing 3, the lobe 35 which projects back is continued and formed in the Thu side from the heel side of the head body 25 at the SOL section 29 side of the back section 33, and this lobe 35 serves as a configuration which the part which extended Perpendicular L to the back section 33 side projected most to back from the sweet spot P of hit ball side 37a of the face object 37 mentioned later.

[0015]

Moreover, the crevice 39 which leaves the periphery section of the face section 31 and carries out opening to the face section 31 concerned is formed in the head body 25 in accordance with the configuration of the back section 33, and as shown in drawing 3, compared with the heel side and the Thu side, as for the head body 25, the lobe 35 side serves as thin meat. And in this crevice 39, it fits in and is fixed so that the face object 37 may become flat-tapped with the face section 31 with a binder.

[0016]

The face object 37 is fabricated with the synthetic resin containing fiber strengthening resin, and the appearance serves as the same configuration as the inside of a crevice 39, and capacity with the big air chamber 41 of the letter of sealing surrounded by the lobe 33 in the fitting section 37b which fits in in the above-mentioned lobe 35 --- with --- **** --- it is prepared.

[0017]

This air chamber 41 is formed in accordance with the inside of a lobe 35, as the back section 33 side of the head body 25 shows drawing 2, and the face section 31 side is considered as hit ball side 37a and abbreviation parallel. And as the thickness m between an air chamber 41 and hit ball side 37a is thickly fabricated by about 3-time abbreviation compared with the thickness n by the side of the back section 33 and the face object 37 was mentioned above. Since the lobe 35 is made into the configuration which the part which extended Perpendicular L from the sweet spot P of the face object 37 to the back section 33 side projected most, the face object 37 of the part concerned and the width of face of an air chamber 41 are the largest.

[0018]

Thus, this example has the structure where the face object 37 including an air chamber 41 had the perimeter surrounded by the metal head body 25 except for hit ball side 37a.

In addition, the score line slot which prepared 43 in hit ball side 37a of the face object 37, and 45 are golf balls in drawing 1.

[0019]

Although the face object 37 will deform by the impact if the hit ball of it is carried out with the golf club equipped with this golf club head, since the golf club head concerning this example is constituted in this way Big repulsion energy starts a golf ball 45 according to the repulsive force and the elastic-deformation force of hit ball side 37a over compression of the air in an air chamber 41. As mentioned above, ** the golf club head of this example Since the face object 37 including an air chamber 41 is the structure where the perimeter was surrounded by the metal head body 25 except for hit ball side 37a, the compression energy of the air by the impact can be efficiently given to a golf ball 45 as repulsion energy.

[0020]

Therefore, according to this example, it became possible to compare with the former and to lengthen the flight distance of a golf ball 45 certainly.

Moreover, the stress by the impact at the time of a hit ball will be absorbed and distributed by the air-cushion operation with the air in an air chamber 41.

[0021]

Therefore, according to this example, breakage of having compared the thickness m between an air chamber 41 and hit ball side 37a with the thickness n by the side of the back section 33, having fabricated thickly, and having aimed at reinforcement by the side of hit ball side 37a and the hit ball side 37 of the face object 37 according to the impact at the time of a hit ball conjointly can prevent certainly.

[0022]

Furthermore, while Thu and heel balance become good by having incorporated the air chamber 41 with a large capacity in the head body 25 according to this example, the part which extended Perpendicular L from the sweet spot P of the face object 37 to the back section 33 side is made to project most, the face object 37 of the part concerned and the width of face of an air chamber 41 are written most greatly, and it has the advantage from which the directivity of a hit ball becomes good compared with the former.

[0023]

[Effect of the Device]

As stated above, according to the golf club head concerning this design, improvement in the flight distance of a golf ball and improvement of endurance to the impact at the time of a hit ball can be aimed at certainly.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the front view of the golf club head concerning the first example of this design.

[Drawing 2] It is the II-II line sectional view of drawing 1.

[Drawing 3] It is the III-III line sectional view of drawing 1.

[Drawing 4] It is the sectional view of the conventional golf club head.

[Drawing 5] It is the sectional view of other conventional golf club heads.

[Description of Notations]

25 Head Body
31 Face Section
33 Back Section
35 Lobe
37 Face Object
37a Hit ball side
39 Crevice
41 Air Chamber

[Translation done.]

【考案の詳細な説明】

【0001】

【産業上の利用分野】

本考案は、飛距離の向上と併せて打球時の衝撃に対する耐久性の向上を図ったゴルフクラブヘッドに関する。

【0002】

【従来の技術】

アイソクアラフのヘッドは、軟鉄やステンレス等の金属によってホーゼル部やソール部、フェース部等が一体的に成形されているのが一般的である。

【0003】

然し、この種のゴルフクラブヘッドは各番手に合わせた形状、重さになっているものの、金属の塊であるため弾性に乏しく、特にボールのヒットに最も重要なフェース部に弾性がないとその反発係数が小さく、又、ウッドクラブのようなソフトな打球感が得られない。

【0004】

そこで、従来、ソフトな打球感を得るため、ヘッド本体のフェース部に樹脂製フェースプレートを取り付けたゴルフクラブヘッドが実公開3-51514号公報に開示されている。

【0005】

このゴルフクラブヘッドは、図4に示すようにヘッド本体1のフェース部3に設けた凹部5に、裏面側に凹欠部7を設けた樹脂製のフェースプレート9をねじ11で着脱自在に取り付けたものである。

【0006】

而して、斯かるゴルフクラブヘッドによれば、フェースプレート9に凹欠部7を設けたことによって打球面が肉薄となり、然も、凹欠部7を設けたことによってフェースプレート9と凹部5の底面5aの間に間隙13ができるので、フェースプレート9の弾性変形による反発力が期待できることとなる。

【0007】

【考案が解決しようとする課題】

然し、斯様に凹欠部7を設けたことによってフェースプレート9に反発力が得られる反面、打球面が肉薄となるためフェースプレート9の強度低下を来とし、而も、上記間隙13は密封構造ではないため、間隙13内の空気が一種のエアクッションとして打球面に掛かる応力を和らげる機能を果たさないことも相俟って、長期に亘る使用によりフェースプレート9が破損してしまう虞があった。

【0008】

又、アイソクアラフに関する考案ではないが、実開昭49-50063号公報には、図5に示すように裏面側に凹状に成形した樹脂製フェースプレート15の打球面中心に、タンガスコンカーバイド製又はチタンコンカーバイドからなるチップ17を植設して、これをヘッド本体19のフェース部21に設けた凹部23に嵌着したウッドクラブヘッドが開示されている。

【0009】

而して、上記ゴルフクラブヘッドにあつても、フェースプレート15の裏面側に凹状に成形したことによってフェースプレート15に反発力が得られるものの、図4に示すゴルフクラブヘッドと同様、打球時の衝撃でフェースプレート15が破損してしまう虞があった。

【0010】

本考案は斯かる実情に鑑み案出されたもので、飛距離の向上と併せて打球時の衝撃に対する耐久性の向上を図ったゴルフクラブヘッドを提供することを目的とする。

【0011】

【課題を解決するための手段】

斯かる目的を達成するため、本考案は、ゴルフクラブヘッドのヘッド本体のバック部を後方へ突出させて当該バック部に突出部を設けると共に、ヘッド本体内に、フェース部に開口し上記バック部の形状に付った内面を有する凹部を形成し、この凹部内に、上記突出部に包囲される密封状の空気室を設けた樹脂製のフェース体を嵌合したものである。

【0012】

【作用】

本考案に係るゴルフクラブヘッドを装着したゴルフクラブで打球したとき、その衝撃によってフェース体は変形するが、空気室内の空気の圧縮に対する反発力とフェース体の打球面の弾性変形力によってゴルフボールに大きな反発エネルギーがかかり、而も、本考案のゴルフクラブヘッドは、空気室がヘッド本体のバック部の突出部に周囲を包囲された構造であるため、衝撃による空気の圧縮エネルギーが効率的に反発エネルギーとしてゴルフボールに伝わることとなる。

【0013】

又、打球時の衝撃による応力を空気室内の空気によるエアクッション作用によって吸収、分散し、フェース体の破損が防止されることとなる。

【0014】

【実施例】

以下、本考案の実施例を図面に基づき詳細に説明する。

図1は本考案の一実施例に係るゴルフクラブヘッドの正面図を示し、図中、25は縦強化金属を含む金属によって形成されたヘッド本体で、従来と同様、このヘッド本体25はホーゼル部27やソール部29、フェース部31、又、図2の如くバック部33等が一体に成形されている。そして、図2及び図3に示すようにバック部33のソール部29側には、後方へ突出する突出部35がヘッド本体25のヒール側からトゥ側に亘って形成されており、この突出部35は、後述するフェース体37の打球面37aのスライスボットPから垂線しをバック部33側に延長した部分が、最も後方へ突出した形状となっている。

【0015】

又、ヘッド本体25には、フェース部31の間隙部を残して当該フェース部31に開口する凹部39が、バック部33の形状に沿って形成されており、図3に示すようにヘッド本体25は、ヒール側やトゥ側に比べて突出部35側が厚肉となっている。そして、この凹部39内に、フェース体37が接着材によってフェース部31と面一となるように嵌合、固定されている。

【0016】

フェース体37は、縦横強化樹脂を含む合成樹脂によって形成されており、その外形は凹部39の内面と同一形状となっている。そして、上記突出部35内に

嵌合するその嵌合部37b内に、突出部35に包囲された密閉状の空気室41が大きな容量を以って設けられている。

【0017】

この空気室41は、ヘッド本体25のバック部33側が図2に示すように突出部35の内面に沿って形成され、又、フェース部31側が打球面37aと略平行とされている。そして、フェース体37は、空気室41と打球面37aの間の肉厚mが、バック部33側の肉厚nに比べ略3倍程度に厚く形成されており、又、上述したように、突出部35はフェース体37のスライスボットPから垂線しをバック部33側に延長した部分が最も突出した形状とされていることから、当該部位のフェース体37及び空気室41の幅が最も大きくなっている。

【0018】

このように、本実施例は、空気室41を含めたフェース体37が、打球面37aを除いて金属製のヘッド本体25に周囲を包囲された構造となっている。

その他、図1に於て、43はフェース体37の打球面37aに設けたスコアライン槽、45はゴルフボールである。

【0019】

本実施例に係るゴルフクラブヘッドはこのように構成されているから、斯かるゴルフクラブヘッドを装着したゴルフクラブで打球すると、その衝撃によってフェース体37は変形するが、空気室41内の空気の圧縮に対する反発力と打球面37aの弾性変形力によってゴルフボール45に大きな反発エネルギーがかかり、而も、上述したように本実施例のゴルフクラブヘッドは、空気室41を含めたフェース体37が打球面37aを除いて金属製のヘッド本体25に周囲を包囲された構造であるため、衝撃による空気の圧縮エネルギーを効率的に反発エネルギーとしてゴルフボール45に与えることができる。

【0020】

従って、本実施例によれば、従来に比しゴルフボール45の飛距離を確実に伸ばすことが可能となった。

又、打球時の衝撃による応力は、空気室41内の空気によるエアクッション作用によって吸収、分散されることとなる。

【0021】

従って、本実施例によれば、空気室41と打球面37aとの間の肉厚mをバツク部33側の肉厚nに比し厚く成形して打球面37a側の補強を図ったことと相俟って、打球時の衝撃によるフェース体37の打球面37の破損が確実に防止できることとなる。

【0022】

更に、本実施例によれば、容重の大きい空気室41をヘッド本体25内に組み込んだことによつて、ヒールバランズが良好となると共に、フェース体37のスイートスポットPから垂線しをバツク部33側に延長した部分を最も突出させて、当該部位のフェース体37と空気室41の幅を最も大きくしたため、打球の方向性が従来に比べ良好となる利点を有する。

【0023】

【考案の効果】

以上述べたように、本考案に係るゴルフクラブヘッドによれば、ゴルフボールの飛距離の向上と打球時の衝撃に対する耐久性の向上が確実に図れることとなった。